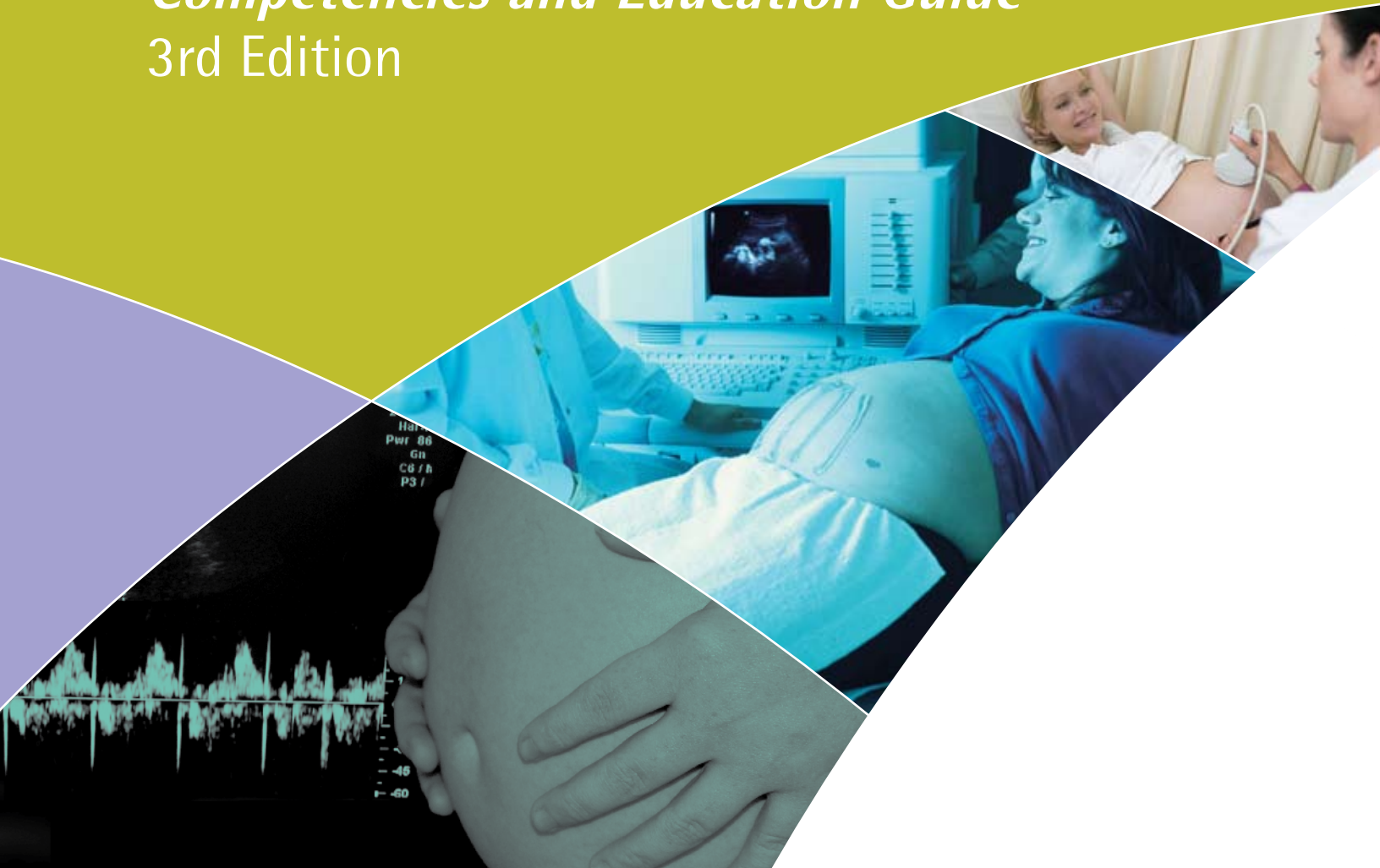


Ultrasound Examinations Performed  
by Nurses in Obstetric, Gynecologic, and  
Reproductive Medicine Settings: *Clinical  
Competencies and Education Guide*  
3rd Edition



# The Association of Women's Health, Obstetric and Neonatal Nurses

*T*he Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) is a nonprofit membership organization of 23,000 nurses who care for mothers, their newborns and women of all ages. AWHONN members are registered nurses, nurse practitioners, certified nurse-midwives and clinical nurse specialists who work in hospitals, independent practices, universities and community clinics.

Our mission is to promote the health of all women and newborns. AWHONN empowers its members with educational resources, legislative programs, research and the support they need to provide the highest level of patient care. Through our many evidence-based education and practice resources, legislative programs, research and coalition work with like-minded organizations and associations, AWHONN has firmly established itself as the leading association for women's health, obstetric and neonatal nurses.

AWHONN members are committed to delivering superior health care to women and newborns in hospitals, home health and ambulatory care settings. The rich diversity of our members' skills and experience make AWHONN the voice for women's health and neonatal nursing. Through their dedication, knowledge, skill and expertise we create resources aimed at achieving our mission to promote the health of women and newborns.

Learn more about the accomplishments of our individual members and the organization as a whole at [www.awhonn.org](http://www.awhonn.org).

# Ultrasound Examinations Performed by Nurses in Obstetric, Gynecologic, and Reproductive Medicine Settings: Clinical Competencies and Education Guide (3rd Edition)

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*T*his guide has been prepared by the AWHONN Task Force to revise the AWHONN education guide, Clinical Competencies and Education Guide: Limited Ultrasound Examinations in Obstetric and Gynecologic/Infertility Settings 2nd ed. Education guides are reviewed periodically. This guide is not intended to be exhaustive; other sources of information and guidance are available and should be consulted. This guide is intended to encourage systematic education and ongoing skill development. It is not designed to define standards of practice for employment, licensure, discipline, legal, or other purposes. Variations and innovations that demonstrably improve the quality of patient care are to be encouraged.

*Ultrasound Examinations Performed by Nurses in Obstetric, Gynecologic, and Reproductive Medicine Settings: Clinical Competencies and Education Guide* (3rd ed.) has been reviewed by individuals, including AWHONN members, who were selected because of their expertise in ultrasound specific to the obstetric, gynecologic, or reproductive medicine setting. We are indebted to all who shared their time and expertise in the development of this resource.

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A smiling couple, a man and a woman, are looking at an ultrasound screen. The man is on the left, and the woman is on the right. They are both smiling and looking at the screen. The screen shows an ultrasound image. The background is a light blue and yellow gradient.

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# Preface

The performance of ultrasound examinations is an appropriate practice for registered nurses (RNs) specializing in obstetrics, gynecology, and reproductive medicine as dictated by the clinical situation. Performing these ultrasound examinations represents an expanded nursing role and thus is not to be undertaken by the novice or inexperienced obstetric, gynecologic, or reproductive medicine RN. Prior to adding this expanded role to their practice, RNs should:

- verify that performance of ultrasounds is within the scope of practice for nurses as defined by their state or provincial licensing body,
- complete the didactic content and hands-on experience outlined in this document, and
- ensure their institution/practice site has a written policy, procedure, and protocol addressing the performance of ultrasounds by RNs.

The purpose of this document is to describe the guidelines for the core content of educational programs and clinical practicums for specific components of standard, limited, and specialized ultrasounds in obstetric, gynecologic, and reproductive medicine. Actual achievement of competency depends upon individual skills, training, and clinical experience.

## Introduction

### OBSTETRIC ULTRASOUND

Fetal ultrasound should be performed only when there is a valid medical reason (American College of Obstetricians and Gynecologists [ACOG], 2009; American Institute of Ultrasound in Medicine [AIUM], 2005, 2007b). Performing an obstetric ultrasound primarily for keepsake images or to determine fetal gender without a medical indication is not recommended (ACOG, 2009; AIUM, 2005, 2007b; Rados, 2004). The U.S. Food and Drug Administration states that the use of ultrasound equipment for these purposes is an unapproved use of a medical device. This practice may violate state or local laws regarding use of such devices without a prescription (Rados, 2004).

ACOG (2009) and AIUM (2007a) have identified three types of obstetric ultrasound examinations performed during pregnancy: standard (also called basic), limited, and specialized (also called detailed) (see Table 1).



**Table 1: Comparison of ACOG and AIUM Types of Obstetric Ultrasound**

<b>Standard Examination</b>	
<b>ACOG</b>	<b>AIUM</b>
Fetal presentation	Fetal presentation
Amniotic fluid volume	Amniotic fluid volume
Cardiac activity	Cardiac activity
Placental position	Placental position
Fetal biometry	Fetal biometry
Fetal number	Fetal number
Anatomic survey	Anatomic survey
	Cervical and adnexal evaluation
<b>Limited Examination</b>	
Fetal heart activity	Fetal heart activity
Fetal presentation	Fetal presentation
Interval growth	Interval growth
Estimated amniotic fluid volume	Estimated amniotic fluid volume
Evaluation of the cervix	Evaluation of cervix
<b>Specialized Examination</b>	
Detailed or targeted anatomic survey	Detailed anatomic survey
Doppler flow	Doppler flow
BPP	BPP
Additional biometric measure	Additional biometric measure
Fetal echocardiography	Fetal echocardiography
Amniotic fluid volume	
<b>First-Trimester Examination</b>	
Evaluation of uterus	+/- intrauterine pregnancy
Evaluation of cervix	Evaluation for ectopic pregnancy
Evaluation of adnexa	Evaluation of vaginal bleeding
+/- gestational or yolk sac	Evaluation of pelvic pain
+/- embryo	Estimation of gestational age
+/- cardiac activity	+/- cardiac activity
Measurement of gestational sac	Adjunct to chorionic villi sampling, embryo transfer, IUD placement
Measurement of crown-rump length	Assessment of anomalies
Determination of fetal number	Determination of fetal number
	Assessment of pelvic/uterine masses
	Assessment of hydatidiform mole

NOTE: +/- = presence or absence of; BPP = biophysical profile; IUD = intrauterine device. From: ACOG, 2009; AIUM, 2008b.

## Standard Ultrasound

A standard ultrasound performed in the second or third trimester includes “evaluation of fetal presentation, amniotic fluid volume, cardiac activity, placental position, fetal biometry, and fetal number, plus an anatomic survey. The maternal cervix and adnexa should be examined as clinically appropriate when technically feasible” (ACOG, 2009, p.2; AIUM, 2007a).

## Limited Obstetric Ultrasound

Limited obstetric ultrasound in the second or third trimester is performed when a targeted maternal/fetal ultrasound assessment is indicated on the basis of the clinical situation (ACOG, 2009; AIUM, 2007a). Limited obstetric ultrasound in any trimester may include measurement of amniotic fluid volume; evaluation of interval growth; evaluation of the cervix; confirmation of fetal cardiac activity or fetal presentation; use as an adjunct to ultrasound-guided amniocentesis or external version; confirmation of embryonic number; measurement of crown–rump length; or confirmation of a yolk sac or uterine sac after a successful attempt at using assisted reproductive technology (ACOG, 2009; AIUM 2008b). In most cases, limited ultrasound examinations are appropriate only after a standard examination has been performed (AIUM, 2007a). Ideally, if a standard ultrasound has not been performed, one should be obtained within a reasonable timeframe following the limited or specialized ultrasound, if indicated.

## Specialized Ultrasound

Specialized ultrasounds are targeted anatomic examinations and are performed when a fetal anomaly is suspected. In addition to anatomic examinations, this category includes fetal Doppler assessment, performance of biophysical profile (BPP), assessment of amniotic fluid, fetal echocardiography, or measurement of additional biometric fetal structures (ACOG, 2009; AIUM, 2007a).



## GYNECOLOGIC AND REPRODUCTIVE MEDICINE ULTRASOUND

A limited ultrasound examination in a gynecologic setting provides targeted rather than complete diagnostic information. It may include, for example, evaluation of the bladder to determine postvoid urine volume, confirmation of intrauterine device (IUD) placement or location, or measurement of endometrial thickness.

A limited ultrasound examination in an assisted reproductive setting also provides targeted rather than complete diagnostic information. It may include determination of the number of developing follicles, measurement of follicular growth, confirmation of early pregnancy, or evaluation of endometrial thickness and pattern (American Society for Reproductive Medicine [ASRM], 2009). It may also be used as an adjunct to ultrasound-guided procedures, such as egg retrieval, cyst or follicular aspiration, and embryo transfer (AIUM, 2008b). Ideally, before a limited ultrasound examination is performed in a reproductive medicine setting, the woman should have had a comprehensive pelvic ultrasound examination within the preceding 6 months to exclude gynecologic pathology (ASRM, 2009). First-trimester ultrasounds are discussed in the obstetric ultrasound section.



# Documentation

When an ultrasound examination is performed, the woman and other health care professionals involved in her care should be informed about the scope of information provided by the examination. The woman should be told why an ultrasound examination is needed — for example, to determine fetal presentation (in an obstetric patient) or to assess follicular development (in a reproductive medicine patient). Women should be informed that limited or specialized obstetric ultrasound examinations performed by a nurse are not intended to evaluate fetal anatomy, placental anomalies, or maternal pelvic masses. Ultrasound examinations performed by nurses in gynecologic or reproductive medicine settings are not intended to identify conditions beyond those identified as the reason for the ultrasound, such as pelvic pathology. Documentation of the ultrasound examination should follow institutional policy and should indicate that the woman was informed and acknowledged the limitations of the study.

Adequate documentation by all members of the health care team, including those who perform ultrasound examinations, is essential for high-quality patient care. A permanent record that is retrievable should include patient identifying information, the name of the facility, the date of the examination, the image orientation, and the examination findings. Timely communication and documentation of ultrasound findings should be provided to the woman's primary health care provider according to institutional policy and procedure (AIUM, 2008a).

## Obstetric Ultrasound

### I. SCOPE OF CLINICAL APPLICATION OF OBSTETRIC ULTRASOUND

Obstetric ultrasound examinations may be used in a variety of clinical situations. These examinations may be conducted in a home setting, in an ambulatory setting for antepartum testing, or in an inpatient setting for labor and delivery or triage. Registered nurses performing obstetric ultrasound examinations must have the skills to obtain an image and interpret the results of the examination they perform. However, if the examination is technically difficult or the information gained is not conclusive, consultation with the primary provider is recommended. For example, in most cases, the placenta will be seen clearly on ultrasound, and the examiner can confirm that it is not extending into the lower uterine segment. If there is any question regarding the lower border of the placenta or if the placenta is found to be in the lower segment, a clinician with the skills to evaluate placental location in relationship to the uterine cervix should be consulted.

## II. NURSING PRACTICE COMPETENCIES IN OBSTETRIC ULTRASOUND

**A.** Before assuming responsibility for performing obstetric ultrasound examinations, all RNs incorporating ultrasound examinations into practice should be able to:

1. describe the indications for ultrasound examinations;
2. provide appropriate patient education regarding the procedure, its purpose, and its limitations;
3. describe and apply the basic principles of ultrasound physics and instrumentation;
4. understand and apply the principles necessary for proficiency in imaging technique;
5. assess the results of the ultrasound;
6. understand the implications for patient care on the basis of ultrasound findings;
7. explain findings to the woman, as indicated;
8. communicate findings to the responsible health care provider according to institutional policy, procedure, and protocol; and
9. document ultrasound findings in the woman's record according to institutional policy, procedure, and protocol.

**B.** Before assuming responsibility for performing obstetric ultrasound examinations, additional competencies may include the ability to:

1. describe normal pelvic anatomy and landmarks, such as the bladder, uterus and cervix;
2. describe basic anatomy and physiology as it relates to the obstetric patient;
3. describe maternal and fetal pathophysiology;
4. recognize and describe embryonic and fetal development;
5. identify the presence or absence of the early intrauterine gestational sac(s), fetal number, presence or absence of cardiac activity, estimate gestational age, and the presence or absence of an intrauterine pregnancy;
6. identify first-trimester pregnancy complications, such as:
  - a. anembryonic pregnancy;
  - b. ectopic pregnancy;
  - c. threatened, incomplete, complete, or missed abortion;
  - d. molar pregnancy; and
  - e. multiple gestation;
7. conduct a second- or third-trimester uterine survey, which must include, at minimum, identification of fetal cardiac activity, fetal presentation, and placental location;
8. describe techniques for assessing amniotic fluid volume (single deepest pocket and AFI);
9. describe ultrasound techniques for evaluating fetal well-being (BPP and modified BPP);
10. describe the parameters for evaluating Doppler flow; and
11. describe the technique for measuring cervical length.

# Gynecologic and Reproductive Medicine Ultrasound

## I. SCOPE OF CLINICAL APPLICATION OF NURSE-PERFORMED GYNECOLOGIC AND REPRODUCTIVE MEDICINE ULTRASOUND

Ultrasound examinations in the context of gynecologic care are used for specific assessments, such as bladder volume evaluation or IUD location, and in conjunction with other gynecologic physical assessments.

Ultrasound examinations in the context of reproductive medicine care are used as an evaluation tool to facilitate assisted reproductive technologies. During assisted reproduction treatment, ultrasound examinations are performed to evaluate the response of a woman to gonadotropin therapy. In addition, ultrasound examinations may be performed to confirm an intrauterine pregnancy after a potentially successful assisted reproductive cycle.

Registered nurses who perform ultrasound examinations in gynecologic and reproductive medicine settings should have the skills to obtain a clear image and interpret all components of the examination they perform. However, if the study is technically difficult, abnormalities are noted, or the information gained is not conclusive, consultation with the primary care provider is recommended.

## II. NURSING PRACTICE COMPETENCIES IN GYNECOLOGIC AND REPRODUCTIVE MEDICINE ULTRASOUND

- A.** Before assuming responsibility for performing ultrasound examinations of gynecologic or reproductive medicine patients, all RNs incorporating ultrasound examinations into practice should be able to:
1. describe the indications for ultrasound examinations;
  2. provide appropriate patient education regarding the procedure, its purpose, and its limitations;
  3. describe and apply the basic principles of ultrasound physics and instrumentation;
  4. understand and apply the principles necessary for proficiency in imaging technique;
  5. understand the implications for patient care on the basis of ultrasound findings;
  6. explain findings to the woman, as indicated;
  7. assess the results of the ultrasound;
  8. communicate findings to the responsible health care provider according to institutional policy, procedure, and protocol; and
  9. document ultrasound findings in the woman's record according to institutional policy, procedure, and protocol.

**B.** Before assuming responsibility for performing ultrasound examinations of gynecologic patients, additional competencies may include the ability to:

1. describe normal gynecologic or pelvic anatomy and landmarks, such as the bladder and uterus;
2. describe the physiologic effect of hormonal influence;
3. identify changes in bladder volume associated with pre- and postvoid states;
4. identify location of IUD; and
5. evaluate endometrial thickness in peri- and postmenopausal women.

**C.** Before assuming responsibility for performing ultrasound examinations of reproductive medicine patients, additional competencies may include the ability to:

1. describe basic physiology as it relates to treatment of the reproductive medicine patient;
2. describe agents used for induction of ovulation and their possible effects on the reproductive system;
3. describe quantitative serum beta human chorionic gonadotropin (hCG) levels as they relate to early pregnancy;
4. describe the indications for ultrasound examinations in monitoring the reproductive medicine patient;

5. perform ultrasound examinations that include identification of the uterus and ovaries, position of the uterus, and thickness of the endometrium (in relation to ovulation monitoring) and determination of presence, size, and number of follicles and as an adjunct to ultrasound-guided procedures;
6. identify anatomic landmarks relative to the first-trimester of pregnancy and early embryology;
7. identify the presence or absence of the early intrauterine gestational sac(s) and measure, if present;
8. identify the fetal number and the presence or absence of cardiac activity;
9. estimate gestational age via crown–rump length;
10. identify the presence or absence of an intrauterine pregnancy; and
11. describe ultrasound findings consistent with first-trimester pregnancy complications, such as:
  - a. anembryonic pregnancy;
  - b. ectopic pregnancy;
  - c. threatened, incomplete, complete, or missed abortion;
  - d. molar pregnancy;
  - e. multiple gestation; and
  - f. heterotopic pregnancy.



# Educational Guidelines for Nurses Performing Ultrasound

The didactic component of an education program for nurses who perform ultrasound should consist of at least 8 hours of instruction specific to the use of ultrasound examinations in obstetric, gynecologic, and reproductive medicine settings. Didactic instruction should be followed by sufficient, direct clinical supervision to obtain competency. The length and amount of hands-on training may vary with the individual nurse and the practice setting (Stringer, Miesnik, Brown, Menei, & Macones, 2003). The opportunity for continued clinical supervision in the RN's practice setting must be provided by qualified supervisors. A qualified preceptor is a clinician with the ability to perform and teach the skills of ultrasound examination, such as an RN with demonstrated competency in ultrasound, a registered diagnostic medical sonographer, or a physician who is skilled in performing ultrasound examinations.

## DIDACTIC CONTENT OUTLINE

Educational programs designed to educate experienced RNs in the use of ultrasound examinations may vary in content depending on the examinations the RN will perform. The following topics should be included in an educational program for any RN who intends to perform ultrasound examinations:

- I. Ultrasound physics and instrumentation
  - A. Sound wave propagation
  - B. Transducer function (including frequency, penetration, and depth properties) and time-gain compensation (gain)
  - C. Resolution
  - D. Artifact
  - E. Proficiency in imaging techniques, including transabdominal, transvaginal, and translabial ultrasound, as indicated
  - F. Bioeffects and safety of ultrasound
- II. Patient education
  - A. Indication for testing and scope of information provided
  - B. Ultrasound examination procedure
  - C. Examination results
  - D. Follow up
- III. Nursing accountability
  - A. Policies, procedures, and protocols
  - B. Professional practice guidelines
  - C. Reporting to and communicating with the primary care provider according to protocol



- D. Documentation in the form of a written report signed by the RN and co-signed by the responsible obstetric, gynecologic, or reproductive medicine care provider, according to facility protocol
- E. Image archiving
- F. Legal and ethical issues
- G. Lines of authority and responsibility (chain of authority)

Additional didactic content should be tailored to the clinical practice setting and the ultrasound examination(s) that the RN will perform and may include the following:

#### I. Obstetric first-trimester ultrasound

- A. Identification of number and measurement of yolk sac(s), gestational sac(s), embryo(s), and fetus(es)
- B. Recognition of early fetal cardiac activity
- C. Determination of intra- vs. extrauterine pregnancy
- D. Use as an adjunct to ultrasound-guided procedures

#### II. Obstetric second- and third-trimester ultrasound

- A. Fetal number and location
- B. Fetal cardiac activity
- C. Fetal presentation
- D. Placental location
- E. Amniotic fluid volume assessment

- F. Biometric measurements to estimate fetal age and weight
- G. Cervical length measurement
- H. Use as adjunct to ultrasound-guided procedures
- I. Modified BPP (amniotic fluid index and nonstress test)
- J. BPP
  - 1. Fetal tone
  - 2. Fetal movement
  - 3. Fetal breathing
  - 4. Amniotic fluid
  - 5. Nonstress test

#### III. Gynecologic ultrasound

- A. Measurement of endometrial thickness
- B. Identification and location of an IUD
- C. Assessment of postvoid residual urine

#### IV. Reproductive medicine ultrasound

- A. Basic physiology as it relates to treatment of the reproductive medicine patient
- B. Agents used for induction of ovulation and their effects
- C. Quantitative serum beta hCG levels in early pregnancy
- D. Identification of uterine position
- E. Uterine size, endometrial thickness, and ovarian follicles
- F. Components of obstetric first-trimester ultrasound (*see I. Obstetric first-trimester ultrasound on this page*)

## CLINICAL LEARNING EXPERIENCES AND EVALUATION

The sequence and specific nature of clinical learning experiences may be adapted to accommodate the learning needs of the individual student and the teaching style of the individual instructor or preceptor.

- I. Practice sessions should include a review of the institution's policy, procedure, and protocol manual and may include:
  - A. ultrasound image reviews,
  - B. small group discussions,
  - C. multidisciplinary clinical conferences,
  - D. case-review sessions,
  - E. one-on-one tutorials,
  - F. self-study, and
  - G. reference material.
- II. Practicums for obstetric, gynecologic, and reproductive medicine ultrasound examinations should consist of a demonstration and return demonstration as clinical practice dictates and may include:
  - A. equipment setup and selection of the appropriate transducer,
  - B. preparation of the woman for the examination,
  - C. placement of the transducer for optimal resolution,
  - D. obtaining a clear image on the monitor,
  - E. documentation of images,
  - F. cleaning equipment according to institutional policy,
  - G. disposing of contaminated and potentially contaminated equipment,
  - H. communicating findings and followup to the woman, and
  - I. documentation and communication of findings to the responsible health care provider according to institutional policy, procedure, and protocol.
- III. Practicums for obstetric ultrasound examinations should consist of demonstration and return demonstration as clinical practice dictates and may include:
  - A. identification of maternal and fetal orientation;
  - B. identification of fetal number;
  - C. identification of fetal cardiac activity;
  - D. identification of fetal presentation;
  - E. identification of placental location;
  - F. identification of fetal breathing movements, fetal tone, and gross fetal movement;
  - G. measurement of amniotic fluid volume;
  - H. measurement of crown-rump length;
  - I. performance of fetal biometry for gestational age and weight; and
  - J. measurement of cervical length and assessment of cervical anatomy.

**IV.** Practicums for gynecologic or reproductive medicine ultrasound should consist of a demonstration and return demonstration as clinical practice dictates and may include:

- A. identification of uterine position using the appropriate transducer,
- B. identification of ovaries using the appropriate transducer,
- C. measurement of uterine size and endometrial thickness,

D. recognition of anatomic and physiologic changes in the endometrium,

E. location and measurement of ovarian follicles,

F. identification of changes in follicles throughout the ovulation process,

G. location of IUD placement,

H. measurement of postvoid residual urine, and

I. other subjects as deemed necessary by the training institution.

## LEARNING VALIDATION

The educational (didactic) program and clinical practicum are intended to provide skills needed by RNs to perform ultrasound examinations. Evaluation of learning may be ongoing during the education process or may be conducted at the conclusion of the learning experience. Ongoing competence evaluation may be determined by institutional policy.

## Summary

Appropriately educated obstetric, gynecologic, and reproductive medicine RNs can learn to perform ultrasound examinations. This document establishes guidelines for educational preparation that provide a foundation for appropriate performance of ultrasound examinations. The performance of ultrasound examinations in obstetric, gynecologic, and reproductive medicine practice requires formal education, including theoretical content and hands-on training sessions supervised by a qualified preceptor. After recommended education, RNs can perform ultrasound examinations according to institutional policy, using written protocols, if such procedures are within their scope of practice.

This document provides suggestions for programs to help RNs obtain appropriate education to perform ultrasound examinations. To maintain competency in performing ultrasound examinations, RNs should participate in reviews and clinical update sessions. Maintenance and documentation of the quality of individual practice in accordance with current guidelines and standards is the inherent responsibility of the professional nurse, the supervisor, and the employing institution.

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# Resources

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